

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Strainer Assembly

We, J. A. ZURN MFG. CO., a corporation organized under the laws of the State of Pennsylvania, 1801 Pittsburgh Avenue, Erie, Pennsylvania, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates generally to strainers and more particularly to an easily removable strainer basket assembly having an extremely large area for straining or filtering liquid.

In strainers built according to the teachings of the prior art, a cylindrical strainer basket is placed in the path of the flow of fluid in a strainer housing between the inlet and the outlet which gives only a limited amount of area for straining undesirable matter from the fluid with the result that the flow of fluid through the strainer is restricted, much of the undesirable matter passes through the strainer housing, and only a comparatively small amount of matter can be removed from the fluid. Strainers heretofore have not been capable of providing an extremely large open area ratio for straining which is often necessary, such as when fine particles are to be strained from the fluid passing through the strainer.

It is, accordingly, an object of our invention to provide a strainer assembly which is simple in construction, economical in cost, economical in manufacture, and efficient in operation.

Another object of our invention is to provide a compact straining member with an unusually large open area ratio for straining particles from the fluid passing therethrough.

Another object of our invention is to provide a compact straining member which can be easily removed from a strainer body and which can readily be assembled and disassembled for cleaning.

Another object of our invention is to provide a compact straining member which may

be utilized in strainer bodies now on the market and in use.

Other objects of our invention will become evident from the following detailed description, taken in conjunction with the accompanying drawings, in which

Fig. 1 is a vertical sectional view of our novel strainer assembly;

Fig. 2 is a perspective view of one form of plate member in the strainer assembly shown in Fig. 1;

Fig. 3 is a perspective view of another form of plate member in the strainer assembly shown in Fig. 1;

Fig. 4 is a plan view of a modified form of our novel strainer assembly; and

Fig. 5 is a view taken on the line 5—5 of Fig. 4.

Referring now to the drawings, we show in Figs. 1, 2 and 3 a cylindrical housing 1 having a laterally extending inlet 2 in the upper side thereof and a laterally extending outlet 3 in the lower opposite side thereof, the inlet 2 and outlet 3 being connected by flanged connections 4 and 5 of conventional construction for connection to conventional flanged pipe lines. The upper end of the housing 1 is open and it defines an upwardly extending, circular seat 6 which nests in a peripheral groove 7 on the under side of a cap 8, a sealing washer or gasket 9 being disposed between the seat 6 of the housing 1 and the bottom of the groove 7 in the cap 8. The cap 8 is secured to the upper end of the housing 1 by screw bolts 10 and C-washers 10a.

Now coming to the gist of our invention, we show a strainer assembly 11 comprising a plurality of intermediate, juxtaposed plate members 12 and 13 shown in Fig. 3 each have an outer margin 14 thereof flanged at right angles thereto with spaced, circumferential recesses 15 cut therefrom. Each member 13 has perforations 21 for straining matter from fluid and an aperture 16 centrally thereof with a downwardly extending, inner marginal

flange 17. A diagonal strap 19 having a central aperture 20 is disposed diametrically across the central aperture 16. Straining members 12 shown in Fig. 2 are of the same diameter as the members 13 and are of substantially the same construction as the members 13 shown in Fig. 3 except that each straining member 12 has a solid, downwardly extending, outer marginal flange 23 and a central aperture 24 with a depending flange 25 with spaced circumferential recesses 26. The aperture 24 has a cross strap 27 with a central aperture 28 disposed diametrically across the aperture 24. A flat bottom plate 29 is disposed on the bottom of the assembly 11 and it has perforations 30 corresponding to the pattern of the perforations 21 in the members 13. The bottom plate 29 also has a central aperture 31. The top member 12 in the assembly 11 has a circular plate 32 secured to the top thereof having a margin 32a thereof extending outwardly from the outer side of the top member 12 for seating on an inwardly directed flange 22 in the housing 1 substantially in horizontal alignment with the bottom of the inlet aperture 2. The perforated bottom plate 29 and the intermediate members 12 and 13 are assembled together on a shaft 33 extending vertically through the apertures 20, 28, and 31 in the members 12 and 13 and the bottom plate 29, respectively. A spring member 34 with offset ends 35 engages the bottom plate 29 and it has a central aperture 36 through which extends the reduced threaded bottom end 37 of the shaft 33. A nut 38 threadably engages the threaded reduced end 37 of the shaft 33 to secure the spring member 34 thereon. A spring member 39 with offset outer ends 40 thereof engages the top plate 32 on the top member 12 in the assembly 11 and the margin of the aperture 42 in the plate 32, the spring member 39 having an aperture through which extends the threaded upper end 44 of the shaft 33. A wing nut 45 threadably engages the threaded upper end 44 of the shaft 33 and urges the spring member 39 against the plate 32. Upon rotation of the wing nut 45, the straining members 12 and 13 and bottom plate 29 are drawn and secured together.

Wire mesh circular screens 46 may be disposed on each of the intermediate plates 12 and 13 for better straining of the material or for the straining of finer material if this is desired. A looped handle 47 is secured in an upright position on the top plate 32 and the upper side thereof is engaged by the under side of the cap 8 to hold the outer marginal portion 32a of the plate 32 securely on the flanged portion 22 of the housing 1.

In the operation of our novel straining assembly, fluid to be filtered or strained enters the inlet 2 of the housing 1 and it passes through the central aperture 42 of the top plate 32 whereupon it flows downwardly and

laterally outwardly through the recesses 26 in the central flanges 25 of alternate straining members 12 in the assembly 11. After passing through the recesses 26 in the flanges 25 in the members 12, the fluid passes in a downward direction through the perforated portions of members 13 and laterally outwardly through the circumferentially spaced recesses 15 in the outer flanges 14 of the plate members 13 whereby the strained fluid passes to the bottom of the housing 1 and outwardly through the outlet 3 thereof. The fluid to be strained passing outwardly through the recesses 26 in the flanges 25 in the lowermost member 112 in the assembly 11 passes through the perforations 30 in the bottom plate 29. After an excess amount of strained material is disposed in the strainer assembly 11, the cap 8 is removed whereby the strainer assembly 11 is lifted from the housing 1 and the plates 12, 13, and 29 are separated by merely turning the wing nut 45. After the plates 12, 13, and 29 have been cleaned, they are again assembled on the shaft 33 and secured thereto between the spring members 34 and 39 by the wing nut 45 engaging the threaded end 44 of the shaft 33.

Figs. 4 and 5 show a strainer assembly 50 the same as the strainer assembly 11 shown in Fig. 1 except for the means of securing the assembly together. The straining members 12 and 13 are identically the same as the straining members 12 and 13 heretofore described except that the cross straps 19 and 27 are eliminated. A top plate 52 has radially, inwardly extending lugs 53 with apertures 54 through which extend shafts 55. A bottom plate 56 has apertures for receiving the lower ends of the shafts 55. Both ends of the shafts 55 are threaded and threadably engage threaded members 57 and 58 which engage the bottom plate 56 and the top plate 52, respectively, to draw and secure the top plate 52, straining members 12 and 13, and the bottom plate 56 together. The operation of this modification of our strainer assembly is the same as that described for the strainer assembly shown in Fig. 1. Inasmuch as the straining members 12 and 13 rest upon each other, cross straps 19 and 27 may be eliminated from the straining members 12 and 13 shown in Figs. 1, 2, and 3.

It will be evident that for a given area, our novel strainer assembly has a maximum open area ratio to provide a straining surface for a maximum amount of fluid so as to remove substantially all of the solid material from a fluid and it will further be evident that our novel compact unit may be readily assembled and disassembled and removed as a unit from the housing 1 for cleaning.

What we claim is:—

1. A strainer comprising a housing having an inlet and an outlet, and a generally cylindrical chamber therebetween, an inwardly

- directed flanged portion disposed on the inner periphery of said cylindrical chamber adjacent said inlet, an assembly of strainer elements comprising a plurality of juxtaposed, centrally apertured, plate members, one set of alternate plate members having a solid inner flange and an outer marginal flange with recesses therein and the other alternate plate members having a solid outer flange and a recessed inner depending flange, the plate members of one set being perforate and means for securing said plate members together, said strainer assembly having a centrally apertured disk-like support plate attached to the upper end thereof and extending outwards to rest on the inwardly directed flange, the arrangement being such that a liquid flow path is provided through the inlet into the central apertures of the plate members, outwards between alternate plate members, downwards through the perforations, then outward to the outlet, the liquid being directed between alternate plates by the inner flanges and downwardly by the outer flanges.
2. A strainer as set forth in claim 1 wherein a mesh screen is disposed on said plate members.

3. A strainer as set forth in claim 1 or 2 wherein a perforated centrally apertured bottom support plate is disposed beneath said juxtaposed members and wherein said means for securing said plate members together comprises an axially extending shaft extending through said apertures and spring members engaging said shaft and said support plates.
4. A strainer as set forth in claim 3 wherein each of said plate members has a strap, with a central orifice, extending diametrically across the central apertures thereof, the shaft extending through the orifices in said straps.
5. A strainer as set forth in claim 3 or 4 wherein the top support plate has an upwardly extending looped handle engageable by a cover on an open upper end of said housing to hold the outwardly extending portion of said top plate on the inwardly directed flange of said housing.
6. The strainer assembly substantially as hereinbefore described and shown in the accompanying drawings.

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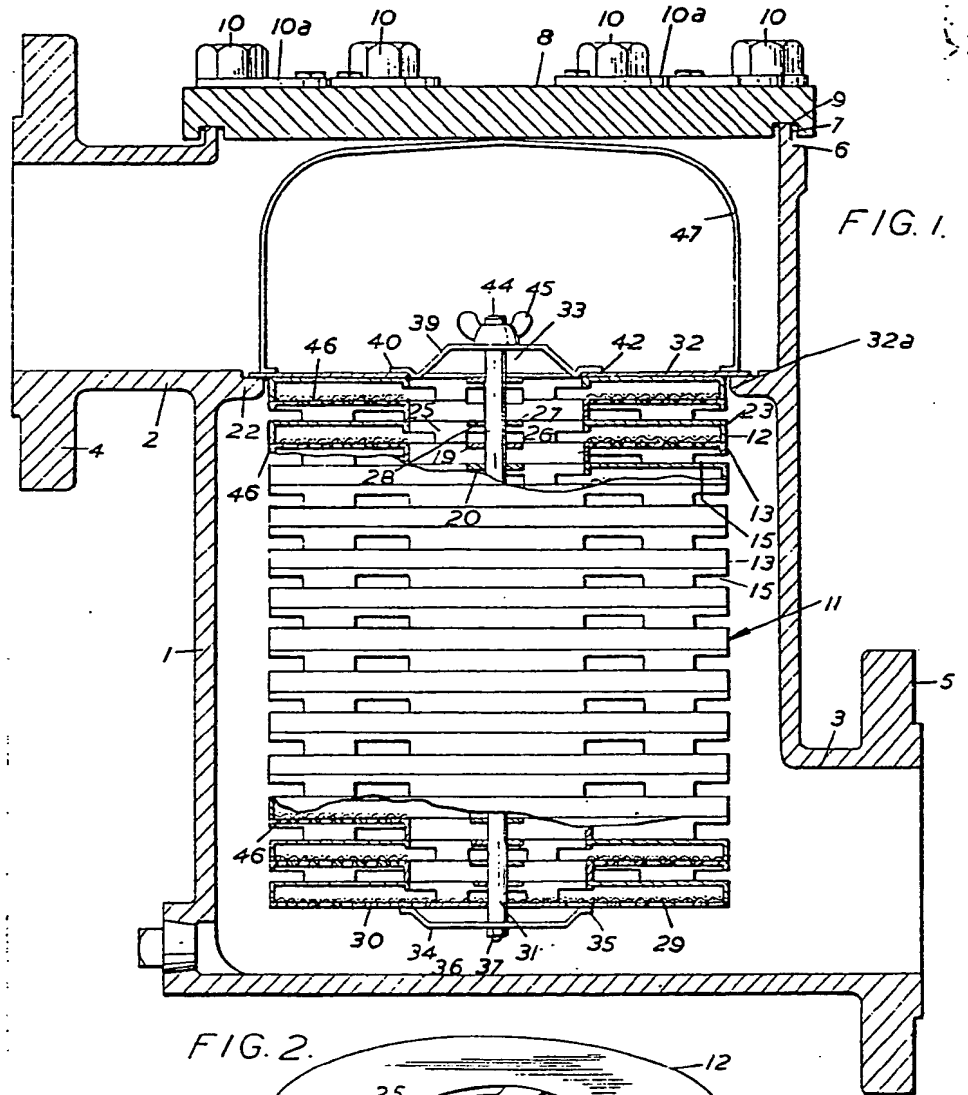


FIG. 2.

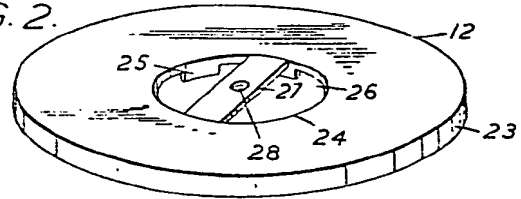
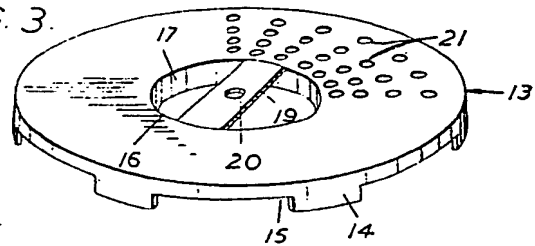


FIG. 3.

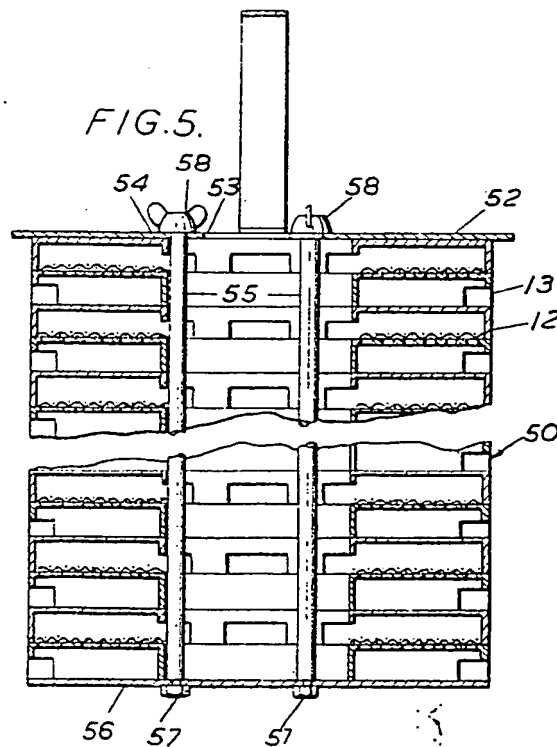
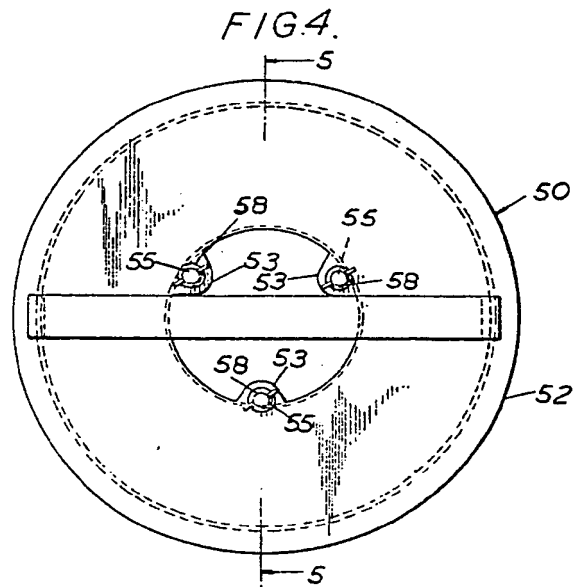
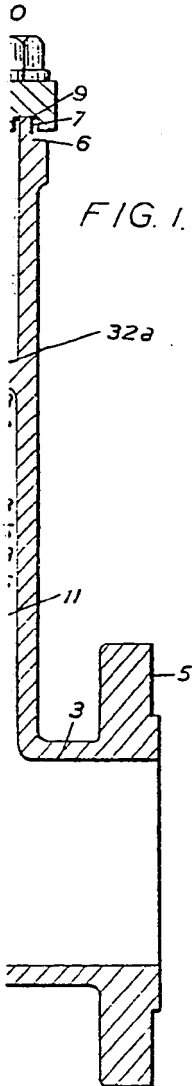


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SHEETS 1 & 2



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